Amendment and Response Under 37 C.F.R. 1.116
Applicant: Curtis Gregory Kelsay
Serial No.: 09/491,994
Filed: January 26, 2000
Docket No.: 10990356-2
Title: AN OPTICAL INTERLINK BETWEEN AN OPTICAL TRANSDUCER AND OPTICAL DATA PORT

REMARKS

The following remarks are made in response to the Final Office Action mailed April 7, 2003, in which claims 20-23, 25-29, 33-39, and 41 were rejected. With this Amendment, claims 20, 28, 34, and 41 have been amended to clarify Applicant's invention. Claims 20-23, 25-29, 33-39, and 41, therefore, remain pending in the application and are presented for reconsideration and allowance.

Claim Rejections under 35 U.S.C. § 103

Claims 20-23, 25-29, 33-39, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Tsuji U.S. Patent No. 5,796,890 in view of the Pressler U.S. Patent No. 6,005,700, the Sedlmayr U.S. Patent No. 6,034,818, and the Kawakami U.S. Patent No. 5,848,203.

With this Amendment, independent claims 20, 28, 34, and 41 have been amended to clarify that the optical data port is adapted to communicate with an open environment. In addition, independent claim 20 has been amended to clarify that the transmit light pipe is adapted to exit and diverge light from the optical data port to the open environment and that the receive light pipe is adapted to converge light from the open environment on the optical transducer, and independent claim 34 has been amended to clarify that the transmit lens is adapted to increase an angle of illumination of light exiting the optical data port to the open environment and that the receive lens is adapted to collimate light from the open environment into the light pipe. Furthermore, independent claims 28 and 41 have been amended to clarify that the method of optically coupling the optical transducer with the optical data port includes receiving light rays from the open environment at that optical data port and exiting the transmitted light rays from the optical data port to the open environment.

With respect to the Tsuji, Pressler, Sedlmayr, and Kawakami patents, none of these patents, individually or in combination, teach or suggest a light pipe assembly, as claimed in independent claim 20, including a transmit light pipe adapted to exit and diverge light from an optical data port to an open environment and a receive light pipe adapted to converge light from the open environment on an optical transducer, an optical interlink, as claimed in independent claim 34, including a transmit lens adapted to increase an angle of illumination of light exiting an optical data port to an open environment and a receive lens adapted to

collimate light from the open environment into a light pipe, nor a method of optically coupling an optical transducer with an optical data port, as claimed in independent claims 28 and 41, including receiving light rays from an open environment at the optical data port and exiting transmitted light rays from the optical data port to the open environment.

For example, the Tsuji patent discloses a control station 10 and a field station 20 connected by optical fibers 41a and 41b (Fig. 1; col. 8, lines 28-41). Light which passes through optical fiber 41a of the Tsuji patent from field station 20 to control station 10 is reflected by an optical light splitter-coupler 133 to a light receiver 132 both located within control station 10 (Fig. 1; col. 8, lines 52-57). Light which passes through optical fiber 41a from field station 20 to control station 10, however, does not exit from control station 10 to an open environment around control station 10. Rather, light which passes through optical fiber 41a from field station 20 to control station 10 is contained within control station 10.

In addition, light which passes through optical fiber 41b of the Tsuji patent from control station 10 to field station 20 is received from a light source 134 located within control station 10 (Fig. 1; col. 8, lines 60-62). Light which passes through optical fiber 41b from control station 10 to field station 20, however, is not received from an open environment around control station 10. Rather, light which passes through optical fiber 41b from control station 10 to field station 20 is received from within control station 10.

Optical fiber 41a, optical fiber 41b, and control station 10 of the Tsuji patent, therefore, do not constitute a transmit light pipe, a receive light pipe, nor an optical data port, respectively, as claimed in independent claims 20, 28, 34, and 41, since light which passes through optical fiber 41a to control station 10 is not exited to an open environment and light which passes through optical fiber 41b to field station 20 is not received from an open environment. Applicant, therefore, submits that the combination of the Tsuji, Pressler, Sedlmayr, and Kawakami patents does not teach or suggest the present invention as claimed in independent claims 20, 28, 34, and 41.

In view of the above, Applicant submits that independent claims 20, 28, 34, and 41 are patentably distinct from the Tsuji, Pressler, Sedlmayr, and Kawakami patents and, therefore, are in a condition for allowance. Furthermore, as dependent claims 21-23 and 25-27 further define patentably distinct claim 20, dependent claims 29 and 33 further define patentably distinct claim 28, and dependent claims 35-39 further define patentably distinct

claim 34, Applicant submits that dependent claims 21-23 and 25-27, 29 and 33, and 35-39 are also in a condition for allowance. Applicant, therefore, requests that the rejection of claims 20-23, 25-29, 33-39, and 41 under 35 U.S.C. 103(a) be reconsidered and withdrawn and that claims 20-23, 25-29, 33-39, and 41 be allowed.

CONCLUSION

In view of the above, Applicant respectfully submits that pending claims 20-23, 25-29, 33-39, and 41 are all in condition for allowance and requests reconsideration of the application and allowance of all pending claims.

Attached hereto is a marked-up version of the changes made to the specification and/or the claims by the current Amendment. The attached pages are captioned **"VERSION WITH MARKINGS TO SHOW CHANGES MADE".**

Any inquiry regarding this Amendment and Response should be directed to Gregg W. Wisdom at Telephone No. (360) 212-8052, Facsimile No. (360) 212-3060. In addition, all correspondence should continue to be directed to the following address:

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Respectfully submitted,

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EXPEDITED PROCEDURE
Examining Group Number 2854

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Curtis Gregory Kelsay	Examiner:	Kevin D. Williams
Serial No.:	09/491,994	Group Art Unit:	2854
Filed:	January 26, 2000	Docket No.:	10990356-2
Title:	AN OPTICAL INTERLINK BETWEEN AN OPTICAL TRANSDUCER AND OPTICAL DATA PORT		

AMENDMENT AND RESPONSE UNDER 37 C.F.R. 1.116

VERSION WITH MARKINGS TO SHOW CHANGES MADE

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir/Madam:

This Amendment and Response is in reply to the Final Office Action mailed April 7, 2003. Applicant respectfully requests entry of this Amendment and is proposing this Amendment to place the application in a condition for allowance. Please amend the above-identified patent application as follows:

IN THE CLAIMS

Please amend claims 20, 28, 34, and 41 as follows:

20. (Currently Amended) A light pipe assembly adapted to optically exchange information between an optical transducer adapted to transmit and receive information optically and an optical data port adapted to communicate with an open environment, the light pipe assembly comprising:

a transmit light pipe adapted to optically transmit information optically transmitted by the optical transducer from the optical transducer to the optical data port; and

a receive light pipe adapted to optically receive information via the optical data port and optically transmit the received information to the optical transducer,

wherein the transmit light pipe is adapted to exit and diverge light from the optical data port to the open environment, and wherein the receive light pipe is adapted to converge light from the open environment on the optical transducer.

21. The light pipe assembly of claim 20, wherein a first end of the transmit light pipe is adapted to be optically coupled to the optical transducer and a second end of the transmit light pipe is adapted to provide a portion of the optical data port.

22. The light pipe assembly of claim 21, further comprising:

a first lens provided between the first end of the transmit light pipe and the optical transducer, wherein the first lens is adapted to optically couple the optical transducer to the transmit light pipe and collimate light received from the optical transducer into the first end of the transmit light pipe; and

a second lens provided at the second end of the transmit light pipe, wherein the second lens is adapted to increase an angle of light exiting the optical data port.

23. The light pipe assembly of claim 22, wherein the first lens and the second lens of the transmit light pipe are formed as part of the transmit light pipe.

24. (Previously Cancelled)

25. The light pipe assembly of claim 20, wherein a first end of the receive light pipe is adapted to be optically coupled to the optical transducer and a second end of the receive light pipe is adapted to provide a portion of the optical data port.

26. The light pipe assembly of claim 25, further comprising:

a first lens provided between the first end of the receive light pipe and the optical transducer, wherein the first lens is adapted to optically couple the receive light pipe to the optical transducer; and

a second lens provided at the second end of the receive light pipe, wherein the second lens is adapted to collimate light received at the optical data port into the second end of the receive light pipe.

27. The light pipe ass mbly of claim 26, wherein the first lens and the second lens of the receive light pipe are formed as part of the receive light pipe.

28. (Currently Amended) A method of optically coupling an optical transducer adapted to transmit and receive information optically with an optical data port adapted to communicate with an open environment, the method comprising:

receiving light rays from the open environment at the optical data port;

collimating the received light rays into a first end of a receive light pipe;

optically transmitting the received light rays within the receive light pipe to a second end of the receive light pipe;

optically transmitting the received light rays to the optical transducer from the second end of the receive light pipe;

receiving the received light rays at the optical transducer;

transmitting light rays from the optical transducer;

collimating the transmitted light rays into a first end of a transmit light pipe;

optically transmitting the transmitted light rays within the transmit light pipe to a second end of the transmit light pipe; and

distributing the transmitted light rays from the second end of the transmit light pipe, including exiting the transmitted light rays from the optical data port to the open environment and increasing an illumination angle of the transmitted light rays from the optical data port.

29. The method of claim 28, wherein collimating the received light rays includes passing the received light rays through a lens at the first end of the receive light pipe.

30. (Previously Cancelled)

31. (Previously Cancelled)

32. (Previously Cancelled)

33. The method of claim 28, wherein increasing the illumination angle of the transmitted light rays includes passing the transmitted light rays through a lens at the second end of the transmit light pipe and diverging the transmitted light rays exiting from the optical data port.

34. (Currently Amended) An optical interlink, comprising:

an optical transducer adapted to transmit and receive information optically;

a light pipe having a first end optically coupled to the optical transducer and a second end arranged to provide an optical data port adapted to communicate with an open environment;

a transmit lens adapted to increase an angle of illumination of light exiting the optical data port to the open environment; and

a receive lens adapted to collimate light from the open environment into the light pipe.

35. The optical interlink of claim 34, wherein the light pipe provides bi-directional communication between the optical transducer and the optical data port.

36. The optical interlink of claim 34, wherein the optical transducer includes an infra-red transducer.

37. The optical interlink of claim 34, wherein the optical transducer includes a receive portion and a transmit portion, and wherein the light pipe includes a receive light pipe optically coupled to the receive portion of the optical transducer and a transmit light pipe optically coupled to the transmit portion of the optical transducer.

38. The optical interlink of claim 37, wherein the transmit lens is adapted to increase the angle of illumination of light from the transmit light pipe and the receive lens is adapted to collimate light into the receive light pipe.

39. The optical interlink of claim 34, wherein the optical interlink is configured to optically exchange information for a printer, wherein the optical transducer and the light pipe are disposed within the printer and wherein the light pipe is adapted to optically exchange information with the optical transducer and externally of the printer.

40. (Previously Cancelled)

41. (Currently Amended) A method of optically coupling an optical transducer adapted to transmit and receive information optically with an optical data port adapted to communicate with an open environment, the method comprising:

receiving light rays from the open environment at the optical data port;

collimating the received light rays into a receive light pipe;

optically transmitting the received light rays within the receive light pipe;

optically transmitting the received light rays to the optical transducer from the receive light pipe, including converging the received light rays on the optical transducer;

transmitting light rays from the optical transducer;

collimating the transmitted light rays into a transmit light pipe;

optically transmitting the transmitted light rays within the transmit light pipe; and

distributing the transmitted light rays from the transmit light pipe, including exiting the transmitted light rays from the optical data port to the open environment and diverging the transmitted light rays from the optical data port.